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This book also contains chapters describing Chicago's first open-air school and Chicago's first open-window school, a paper on ventilation of schoolrooms, a chart showing the methods and results of open-air schools in eight American cities, and a bibliography of the open-air school movement.

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The Teaching of Agriculture in the High School. By GARLAND ARMOR BRICKER.
With an Introduction by W. C. BAGLEY. New York: Macmillan, 1911.
Pp. xxv+202. \$1.00 net.

The rapid spread of agricultural instruction in the public schools makes welcome every attempt to furnish criteria for selection of materials and guiding principles for their presentation, even though we have, as yet, too little recorded experience of successful practice in teaching agriculture to serve as a basis of confident advice.

This book performs a distinct service in seeking to state the problem and to offer definite suggestions for its solution by showing how the organization of the materials should be conditioned on known laws of mental activity. While the attempt is made in the first chapter to define secondary-school agriculture as something that "lies between the two extremes" of the agriculture of the elementary grades and the professional and research work of the college, the only real standards available are those like the excellent exercises in chaps. ix and x, supplemented by familiar texts for comparison.

The rise and development of secondary education in agriculture in the United States and a statement of the diverse legislative sanctions under which agriculture is taught are presented in chap. ii as clearly as possible in so brief a treatment. Under the circumstances a proper differentiation of types is difficult; for instance, the four technical schools of Arkansas and the state-supported agricultural departments added to ten Virginia high schools already established could hardly be called "congressional-district agricultural schools."

The chapter on the social results of secondary agriculture is an argument from a priori grounds, and is not a sociological study. Only a very small beginning has been made in the collection of the statistics necessary for such a study. However, the discussion will be suggestive to workers in the rural field.

The rather energetic contention in chap. iv that "secondary agriculture should be taught as a separate science" will not stir up the opposition it may have done when it appeared in *Education* three years ago. The other thing simply is not noticed now by educational statisticians. To fail to use agricultural applications in the conventional sciences is as reprehensible as to omit applications found in the kitchen, the shop, or in commerce.

Probably the most notable contribution in this book to educational theory as applied to agricultural instruction is furnished by the chapter on the psychological determination of sequence and the complementary discussion on seasonal determination of sequence. A specialist in agricultural education could hardly fail, after spending a year with Dr. Bagley, to present something of value by way of making direct application of present-day psychology to the specific problem. The reviewer had this chapter read by an instructor in psychology who has shown skill both in teaching and in research, though without special interest in natural science. From his standpoint the adaptation was ably made. While the reaction was probably

typical for this class of readers, it might be quite different in the case of the ordinary teachers of agriculture, for the language of psychology is somewhat strange to the uninitiated. The chapter is worth careful perusal even at the cost of some mental effort.

The chapter on the organization of the course is a disappointment in that it seems only to plan for an elementary course continuing through but a single year, and makes no attempt either to evaluate the subdivisions of agricultural subject-matter with reference to the different years of the curriculum or to suggest how best to utilize the well-established sciences of the earlier and later years. These are important considerations, for not less than two hundred and fifty public high schools in 1911-12 have agriculture taught in two or more years, not to mention fifty or more special schools. It is only just to state that the number of high schools with the more extensive courses was only about sixty when the manuscript was completed—so rapidly is the movement growing.

The chapters on aims and methods of presentation, the organization of the laboratory and field work, and that containing an illustrative list of classified exercises, are full of practical suggestions regarding the technique of instruction. The twenty-nine illustrations, arranged on seventeen plates, are well executed and chosen with discrimination, being better calculated to give an idea of real student activities than is often the case in agricultural publications. The index, consisting of twelve pages, is especially complete. One wonders why the publishers did not group the thirteen or more pages of ten-point references at the end of each chapter or in the appendix, instead of cluttering up the pages with them to the distraction of the reader, even though they do add an air of profundity to the page. They are useful only to the investigator.

Fundamentals of Agriculture. Edited by JAMES EDWARD HALLIGAN. Boston: D. C. Heath & Co., 1911. Pp. iv+492. \$1.20.

The encyclopedic flavor of several agricultural texts has drawn forth criticism from many quarters. This book outdoes its competitors in this respect. As a reference book for schools unable to acquire even a small departmental library it should prove of distinct value. Many of the twenty-eight collaborators are well known outside the circle of workers in their special fields and are authors of standard works.

While the chapter headings are conventional, a list of the seventy-eight subdivisions would show the wide range of topics treated, in most cases quite intensively. One such, "The Injury of Gas and Electricity to Trees," is as unusual as is the English of its title. The book is quite free from one fault pointed out in some agricultural texts, namely, that they leave out agriculture—the raising of crops and the care of animals. The illustrations often suffer from poor execution and are sometimes rather pointless.

Though possessing distinct merit as a reference book, the claim that the work is adapted for use as a textbook is open to question and deserves more than passing note, especially so since the study of agriculture is increasing so rapidly and since its methods of instruction show such improvement. The marked unevenness of treatment is incidental to the number of contributors. The discussion of bees is briefer and more simple than that given in certain well-known nature-study handbooks. Other topics clearly should not be attempted below the eleventh or twelfth grade. An example of avoidable duplication is found in the fact that the same amount